

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for qualifying a leakage current to be tolerable ~~or not~~, the leakage current being present in a first test area of ~~a hardware~~ an integrated circuit which comprises said first test area between a first node and a second node being able to be forced to a predefined voltage potential, the method comprising the steps of:
 - a) providing a first node coupled to said first test area, a second node coupled to a predefined voltage potential, and a receiver device having an input, an output and a threshold voltage level associated with the input for switching the output from a first state to a second state.
 - [[a)]] b) shutting off any operational current flow into said first test area,
 - [[b)]] c) generating an evaluable voltage difference between a first voltage level at said first node and said second node being characteristic for corresponding to said leakage current to provide a resulting voltage at said first node, and
 - [[c)]] d) qualifying said leakage current as tolerable or not in dependence of the resulting voltage at said first node when said first voltage level is between the threshold voltage level and the predefined voltage potential.
2. (Currently Amended) The method according to claim 1, wherein said leakage current flows in a test path comprising a switching element acting as an Ohm-resistor having a predetermined operational resistance, and said first test area being connected in series to said resistor.
3. (Original) The method according to claim 2, wherein said resistor is a transistor switched in pass mode.

DE9-2000-0072-US1
09/682,924

4. (Original) The method according to claim 1, wherein said first node is a tap node between two transistors of a driver stage, forming a voltage divider.
5. (Currently Amended) The method according to claim 4, wherein a test region comprising said first test area and a second test area includes [[a]] said receiver device of a combined driver/receiver stage of a semiconductor chip.
6. (Currently Amended) The method according to claim 5, wherein said test region is used for qualifying and/or quantifying the leakage current in a signal input/output ~~book~~ stage of a semiconductor chip.
7. (Currently Amended) An ~~hardware~~ integrated circuit for qualifying a leakage current to be tolerable ~~or not~~, the ~~hardware~~ integrated circuit comprising:
 - ~~a) a leakage test area between a first node and a second node, the second node arranged to be forced to a predefined voltage potential;~~
 - a) a leakage test area, a first node, a second node coupled to a predefined voltage potential and a receiver device having an input and an output, a threshold voltage level associated with the input for switching the output from a first state to a second state,
 - b) a first device for shutting off any operational current flow into at least said leakage test area,
 - c) a second device for generating ~~an evaluable voltage difference between a first voltage level at~~ an evaluable voltage difference between a first voltage level at said first node and ~~said second node being characteristic for corresponding to said leakage current to provide a resulting voltage at said first node,~~ and
 - d) a third device for qualifying ~~and/or quantifying said leakage current as tolerable or not in dependence of the resulting voltage at said first node~~ and/or quantifying said leakage current as tolerable or not in dependence of the resulting voltage at said first node ~~when said first~~

DE9-2000-0072-USI
09/682,924

voltage level is between the threshold voltage level and the predefined voltage potential.

8. (Currently Amended) The hardware integrated circuit according to claim 7, wherein said first node is implemented as a tap node of a voltage divider.
9. (Currently Amended) The hardware integrated circuit according to claim 8, wherein said voltage divider comprises a first and a second transistor connected in series, and said tap node is connected between the drain of the first transistor and the source of the second transistor, the gate of each of said first and second transistors being connected to selectively run two different test modes, in each of which a respective other transistor is switched in pass mode and forms part of the test path when the respective other transistor is switched in lock mode.
10. (Currently Amended) The hardware integrated circuit according to claim 9, wherein the circuit is arranged as a combined input/output stage of a semiconductor chip having a driving P-device comprising a plurality of P-type transistors and a driving N-device comprising a second plurality of N-type transistors, said driving P-device and said driving N-device being connected in series between a first voltage level and a second voltage level, said drive devices driving high, low, and HZ states to a terminal pad connecting off from the semiconductor chip, the circuit further comprising ~~a receiving~~ the receiver device connected in parallel to said terminal pad, wherein when an electrical resistance of one of said first and second transistors in pass mode is implemented as $R = (VDD - V_H) / I_{leakmax} (max)$, where R represents the electrical resistance of said one transistor in pass mode, VDD represents the supply voltage, V_H represents a voltage at said pad terminal, and ~~I_{leakmax}~~ I_{leak} (max) represents a maximum allowed leakage current of said one transistor in pass mode, the ~~receiving receiver~~ device is prevented

DE9-2000-0072-US1
09/682,924

from switching when coming from initial-state to test-state of said input/output stage.

11. (Currently Amended) The hardware integrated circuit according to claim 9, wherein the circuit is arranged as a combined input/output stage of a semiconductor chip having a driving P-device comprising a plurality of P- type transistors and a driving N-device comprising a second plurality of N-type transistors, said driving P-device and said driving N-device being connected in series between a first voltage level and a second voltage level, said drive devices driving high, low, and HZ states to a terminal pad connecting off from the semiconductor chip, the circuit further comprising a receiving receiver device connected in parallel to said terminal pad, wherein when an electrical resistance of one of said first and second transistors in pass mode is implemented as $R = VL / I_{leakmax} I_{leak (max)}$, where R represents the electrical resistance of said one transistor in pass mode, VL represents a voltage at said pad terminal, and $I_{leakmax} I_{leak (max)}$ represents a maximum allowed leakage current of said one transistor in pass mode, the receiving receiver device is prevented from switching when coming from lower resistance values associated with the pass mode of said input/output stage.
12. (Currently Amended) The hardware integrated circuit according to claim 7, wherein the circuit is used in a semiconductor chip.
13. (Currently Amended) The hardware integrated circuit according to claim 7, wherein the circuit is used in a semiconductor chip module.
14. (Currently Amended) The hardware integrated circuit according to claim 7, wherein the circuit is used in a semiconductor multi-chip module.

DE9-2000-0072-US I
09/682,924

15. (Currently Amended) The ~~hardware~~ integrated circuit according to claim 7, wherein the circuit is used in a printed circuit board.
16. (Currently Amended) A computer program product for execution in a data processing system comprising computer program code portions for performing respective steps of a method for qualifying a leakage current to be tolerable ~~or not~~, the leakage current being present in a first test area of ~~a hardware~~ an integrated circuit ~~which comprises said first test area between a first node and a second node being able to be forced to a voltage potential of a predefined value~~, when said computer program code portions are executed on a computer, the method comprising the steps of:
- a) providing a first node coupled to said first test area, a second node coupled to a predefined voltage potential, and a receiver device having an input, an output and a threshold voltage level associated with the input for switching the output from a first state to a second state,
 - ~~[[a)]]~~ b) shutting off any operational current flow into said first test area,
 - ~~[[b)]]~~ c) generating an evaluable voltage difference between a first voltage level at said first node and said second node being characteristic for corresponding to said leakage current to provide a resulting voltage at said first node, and
 - ~~[[c)]]~~ d) qualifying said leakage current as tolerable or not in dependence of the resulting voltage at said first node when said first voltage level is between the threshold voltage level and the predefined voltage potential.
17. (Currently Amended) A computer program product stored on a computer usable medium comprising computer readable program code portions for causing a computer to perform a method for qualifying a leakage current to be tolerable ~~or not~~, the leakage current being present in a first test area of ~~a hardware~~ an integrated circuit ~~which comprises said first test area between a first node and a second node being able to be forced to a voltage~~

DE9-2000-0072-US1
09/682,924

~~potential of a predefined value~~, when said computer readable program code portions are executed on a computer, the method comprising the steps of:

a) providing a first node coupled to said first test area, a second node coupled to a predefined voltage potential, and a receiver device having an input, an output and a threshold voltage level associated with the input for switching the output from a first state to a second state,

[[a)]] b) shutting off any operational current flow into said first test area,

[[b)]] c) generating ~~an evaluable voltage difference between a first voltage level at~~ said first node and ~~said second node being characteristic for corresponding to said~~ leakage current to provide a resulting voltage at said first node, and

[[c)]] d) qualifying said leakage current as tolerable ~~or not in dependence of the resulting voltage at said first node~~ when said first voltage level is between the threshold voltage level and the predefined voltage potential.

18. (New) The method according to claim 1, wherein said first node is coupled to the input of the receiver device.
19. (New) The method according to claim 18, wherein when said leakage current is qualified as tolerable, the output of said receiver device switches from the first state to the second state.
20. (New) The method according to claim 1, wherein when said first voltage level is not between the threshold voltage level and the predefined voltage potential, qualifying said leakage current as not tolerable.